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BY

ARTHUR TEMPLER DAVIES,

M.D. (Cantab.), F.R.C.P.,

Physician to The Royal Hospital for Diseases of the Chest ; Physician (in London) to The Royal National Hospital for Consumption, Ventnor ; Physician to The Metropolitan Hospital.

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ORGANO-THERAPY—ANCIENT AND MODERN.

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MR. PRESIDENT AND GENTLEMEN,—No one who undertakes the task of delivering the annual oration before this venerable society can do so without feeling the honour which it implies and the responsibility which it carries. I am deeply sensible of the former and am only too conscious of the latter.

PART I.

The shield of John Hunter has been burnished so often, and with such sharp-sighted devotion that no flaw or speck remains. Nevertheless, it is only fitting that our Society, which is proud to bear his name, should at the commencement of its *annus medicus* commemorate his worth and work, and so do honour to him and indirectly to itself. It has been remarked by Sir Thomas Browne* that “there is no antidote against the opium of time, which temporally considereth all things; our fathers find their graves in our short memories, and sadly tell us how we may be buried in our survivors’. The greater part must be content to be as though they had not been—to be found in the register of God, not in the memory of man.” True, indeed,

* *Hydriotaphia*, p. 156, 157.

as this remark is of the majority of mankind, it is not so for all. One hundred and nine years ago John Hunter died, but of no one can it be more aptly said, "he being dead yet speaketh." Indeed, no one ever less needed a memorial or monument. Let any one seeking such stand in that great museum which his untiring energy brought together, and to such an one it may be fittingly replied in the words inscribed on the interior of our great Metropolitan Cathedral, of its architect, "*Si Monumentum requiris, circumspice.*" I do not propose to-night to portray his life and character, or friendships, or to narrate his struggles and successes, his failures or rewards—these have from time to time been vividly depicted by my predecessors in this place, with an eloquence and grace of diction to which I cannot aspire; rather I have preferred to dig in that vast mine of accumulated observation and fact, still so fresh and fascinating—which are contained in his works—for the subject-matter of my oration.

John Hunter, in his observations on certain parts of the Animal *Œconomy*, p. 44, states, "It is well known that many orders of animals have two parts designed for the purpose of generation, different in individuals of the same species, by which they are distinguished into male and female, but this is not the only mark of distinction, in the greatest part the male being distinguished from the female by various other marks." He then describes these secondary marks or varieties, such as the superior strength of the male in all animals, as being more disposed to fight, and hence is furnished with parts for such purpose, *i.e.*, the horns of the bull and the spur of the cock, although in carnivorous animals, such as the dog and bitch, he and she cat, cock and hen of the eagle, the difference between the male and female consists chiefly in the external covering. "To bring the foregoing observations into one point of view, I here beg leave to remark that in animals just born or very young, there are no peculiarities to distinguish one sex from the other, exclusive of what relates to the organs of generation, which can only be in those who have external parts, and that towards the age of maturity the discriminating changes before mentioned begin to appear, the male then losing that resemblance to the female in various secondary properties, but that in all animals

which are not of any distinct sex, called hermaphrodites, there is no such alteration taking place in their form when they arrive at that age. It is evidently the male which at this time in such respects recedes from the female, every female being at the age of maturity more like the young of the same species than the male is observed to be ; and if the male is deprived of his testes when young he retains more of the original youthful form, and therefore more resembles the female. They are curious facts in the natural history of animals that by depriving either sex of the true parts of generation, they shall seem to approach each other in appearance, and acquire a resemblance to the unnatural hermaphrodite." He quotes instances of the hen pheasant appearing occasionally with the feathers of the cock, and also a pied peahen displaying feathers like a pied peacock, and what was remarkable that in all these instances the birds, although they previously had produced young, were never afterwards impregnated. These changes Hunter considers as the effect of age, for he says, "we find something similar taking place even in the human species, for that increase of hair observed on the faces of many women in advanced life is an approach towards the beard, which is one of the most distinguishing properties of man. Thus the female, at a later period of life, when the powers of propagation cease, loses many of her peculiar properties, and may be said, except from mere structure of parts, to be of no sex, even receding from the original character of the animal, and approaching in appearance towards the male, or perhaps more properly towards the hermaphrodite." I have quoted somewhat freely from the original paper of John Hunter, in order to show how clear was his knowledge of the profound influence of the essential generative organs on the animal œconomy, and also because his observations are the standpoint on which I have based the following remarks. The use of animal extracts as therapeutic medicinal agents dates from very remote antiquity. Amongst the native tribes of Central Australia,* and in the Northern and Western Arunta, a part of the internal reproductive organs (called entoacha) taken from the male opossum, wallaby, emu, or kangaroo is given for the purpose

* Spencer and Giltner. *The Native Tribes of Central Australia*, p. 465.

of strengthening a delicate woman. It is also used for aphrodisiac purposes in both sexes. And further* in the Boulia District, after the First Ceremonial (female) the semen is carefully preserved and kept, in order to be given as a tonic to sick persons. Here in this custom we have a distinct anticipation of Brown-Séquard's experiments and views. Again, savages in different parts of the world have long been in the habit of eating a portion of the hearts of their enemies killed in battle in order that they may thereby acquire the courage of the valorous dead, and this idea has lasted down to the present date. Thus in the last Ashanti war, Dr. Norman Moore informs me that a native medical student told him that the native warriors used to tear out the hearts of the slain Highlanders of the 42nd regiment, and eat them in order to acquire their courage, and not from any idea of cannibalism ; just in the same way according to this educated medical Ashanti we endeavour to obtain strength from a prescription.

Savages have long been accustomed to swallow snake poison in order to acquire immunity, and modern scientific research has entirely confirmed this practice. Thus Dr. T. R. Fraser,† in 1895, made some very interesting experiments on the subject, and found (1) that enormous doses of venomous snake poison, amounting to as much as 1,000 times the minimum lethal dose in the case of the white rat, could be given by the stomach to cats, and to the amount of 180 times the lethal subcutaneous dose could be given to rats without any poisonous results ; (2) that after animals had received the poison by the stomach, the subcutaneous injection of one-and-a-half times the minimum lethal dose produced no constitutional effect whatever, and, further, that a kitten whose mother had been so treated, was itself injected without any constitutional effect, except slight drowsiness. One of the earliest records of organo-therapy is to be found in the Ebers Papyrus of the eighteenth dynasty, 1500 b.c. ; in this, human brains are prescribed for diseases of the eye—the exact translation is as follows : “ Let one take a human brain and divide it in half ; let one half of it be added

* *Ethnological Studies among the North West Central Queensland Aborigines.*
Walter E. Roth.

† *British Medical Journal*, p. 415. Vol. 2. 1895.

to honey, and the eye be anointed with this in the evening the other half should be dried and finely ground, and it may then be spread for anointing the eyes in the morning." There is also a prescription for suppurative ear disease of a powder consisting of the head of the amama animal, gazelles' ears (?), tortoise shell and annek plant. In the Talmund, 523 B.C., a dog's liver is prescribed for the bite of a mad dog. But it is in China and other Eastern nations, where customs have remained unchanged for thousands of years, that we find animal extracts largely employed as favourite medicinal remedies from the earliest times down to the present day. Thus the skulls, paws, horns, and skins of many animals, as the bear, bat, crocodile, tiger, are used in medicine ; for a fever, a decoction of scorpion is prescribed ; pigeon's dung is a favourite remedy in pregnancy ; the juice expressed from the lungs of pigs is good for chest complaints, and that from the intestines for dysentery and diarrhoea ; the brain is given for migraine. Urine is taken internally to promote the circulation of the blood, and to accelerate labour. The best remedy to give strength to the parturient is to administer the placenta either in its natural state or desiccated and made into pills.* One of the industries of Foo Chow is the rearing of snakes, which are used by druggists to prepare medicine. Snake urine is used as a febrifuge, and snake flesh is considered nutritious diet for invalids. Ordure, from man downwards to rabbits is used ; pills made from the excrement of the Grand Llama of Thibet are considered infallible antidotes for disease. Human blood, tiger's blood, dried toads and leeches, centipedes, stag's horns and bones, spotted lizard and silkworm were considered tonics. Gordon Cummings says these are not the worst, for some of the physicians order a broth made of human flesh cut from the arm or thigh of the son or daughter of the patient, and he quotes the case of a young girl who so mutilated herself to save her mother,† and was highly commended. The Chinese also highly value pirates' bile as a valour-breeding liquid when injected. They have a great belief in the invigorating effects of human blood ; thus leprosy is believed to be curable by drinking

* Berdoe. *Popular History of Medicine*, p. 131.

† *Official Gazette*, Pekin, 1870.

the blood of a healthy infant, and at public executions the executioners soak up the blood with balls of pith, which are dried and sold to the druggists under the name of shue-man-tou (blood bread), which is prescribed for a disease supposed to be consumption. Believing in a close functional connection between the liver and the eyes, we find that in icterus and hepatitis, extract of pig's liver with vinegar and ox-gall is prescribed. In one of his Japanese poems, called "The Grateful Foxes," Sir Edwin Arnold narrates how it was necessary to obtain a fox's liver in order to cure a Royal Princess of her sickness, and how it was only obtained by the fox's wife, in return for kindness once shown by the Princess to foxes, bringing her husband's liver in a basket and placing it at the foot of the Princess's couch, who having eaten it was thereby cured of her illness. For loss of virility a preparation of the testicles of the tiger, grilled, crushed, and mixed with arack is given—here again we have an anticipation of Brown-Séquard.

The Hindoos from an early date have derived simple medicines from the animal kingdom. Their number is very large and I will only quote a few. Thus, Mootra (urine) is considered a most useful agent, and was prescribed for cough and eye diseases, goat's urine for jaundice, buffalo's for piles, and elephant's for blood diseases, cow's urine was given internally and externally, that of the horse for killing worms, of the ass for consumption and insanity, and of the camel for ringworm, that of the castrated bullock for anæmia and dysentery. The urine of the female was considered the most efficacious, except that of the horse, ass, camel, and elephant. Pitta (bile of fish and other aquatic creatures) was given for fever and other diseases. Purisha (dung of a cow) was applied to inflammation of the skin. Garala (venom of snake) for dropsy. Mansa (goat's flesh) was used for rheumatism, an essence of dove's flesh fixed in oil for paralysis, elephant's milk was used for eye diseases, camel's in dropsy and asthma, goat's in phthisis and blood diseases, and sheep's to promote the growth of hair. Sheringha (horn of a stag) has various medicinal uses; made into a paste it was used for sprains, contusions and fissures, and applied to the forehead for headache. Danta (tooth of elephant) was prescribed for leucorrhœa, and medar, fat of camel or hyaena

was considered a valuable remedy for gouty joints ; cuttle fish bones were also used medicinally.*

The Greeks largely practised organo-therapy and consequently the Romans. Homer, 1000 B.C., relates how the wise physician Cheiron trained Achilles on marrow to give him strength. In the writings of Democritus, who was born 450 B.C. we find, according to Pliny, that for some diseases the skull of a malefactor is most efficacious, while for others that of a friend or guest is the best ! In the genuine writings of Hippocrates there is very little mention of the use of animal extracts, except that he considered dung of animals such as that of the goat and asses as of medicinal use. He also used a fish called Uranocus, the star-gazer, against dropsy. In the supposititious works † attributed to him we find recommended human placenta, gall, liver and urine of the bull. Horns of deer and goat, cuttle fish's bones and eggs and urine of man.‡ Celsus, 50 B.C. to A.D. 7, in his “*De Medicina*,” has scanty notice of animal extracts. He recommends scorpions for snake bites, “*pulcherrimum medicamentum est*”; castor for tetanus. He also refers to the practice of epileptics drinking human blood. “*De comitialis morbi curationibus—Quidam jugulati gladioris calido sanguine epoto tali morbo se liberaverunt.*”

Aretaeus, 1st century, A.D., states the “best of all cures for epilepsy is the testes of the beaver and the compound medicine from vipers. It is told that the brain of a vulture and the heart of a raw cormorant and domestic weasel when eaten remove the disease, but I have never tried these ; however, I have seen persons holding a cup below the wound of a man recently slaughtered and drinking a draught of the blood. There is another story of the liver of a man having been eaten.” He advises viper's flesh for diabetes, and the shavings of an elephant's tooth, one drachm in wine to the amount of two cyathi as a cure for elephantiasis—he used the mixture called *Mithradatium*, containing a vast number of ingredients, to which Andromachus, physician to the Emperor Nero, added vipers' flesh.

* “*The History of Aryan Medical Science*,” by “*The Thakore Sahib of Gondal*,” p. 129, 130, and 131.

† “*History of Physick*,” written originally in French by Daniel Le Clerc, M.D., and made English by Drs. Drake and Baden, 1699.

‡ Lib. III., Chap. XIII.

The most remarkable account of the use of animal extracts is to be found in "*The Natural History*" of C. Pliny Secundus. Thus he gives 286 observations on remedies derived from man, on eight remedies from the elephant, ten from the lion and camel, seventy-nine from the hyaena,—a pharmacopœia in itself—nineteen from the crocodile, fifteen from the chameleon, seven from the hippopotamus. To quote a few, the fasting saliva of a human being is a sovereign preservative against poison of serpents, and it removes lichens and leprous spots and cures ophthalmia; human ear wax and powdered human tooth cure serpent stings; a man's hair in vinegar is good for bite of a mad dog and wounds in the head; human blood is a good application for quinsies; urine of eunuch promotes fruitfulness in women; male urine cures gout, and is a useful liniment for bruises, sores, and diseases of the rectum. The elephant's blood is good for rheumatism and consumption, its liver for epilepsy. The lion's heart, as a food, cures quartan fevers, the gall improves the eyesight—used as an ointment. Camel's brain, in vinegar, cures epilepsy; also its gall in honey, which is a remedy for quinsies. Ashes of burnt camel's dung mixed with oil cure dysentery and epilepsy—the heart, taken with food or drink, is remedial for all palpitations of the heart. The strings of the kidneys in wine restore fruitfulness; the uterus is highly beneficial for diseases of the uterus, if taken in drink with rind of sweet pomegranate; the gall bladder is beneficial for cardiac disease, and the bladder taken in wine for incontinence of urine; the liver in drink cures griping pains and urinary calculi and quartan ague; its dried dung is useful for dysentery; the shoulders are useful for pain in the arm and shoulders. The crocodile's fat applied to the hair makes it fall off; its flesh boiled cures sciatica and chronic cough in children; its dung in oxymel cures epilepsy. A broth made from tripe is an excellent gargle for ulcerations of the tongue and trachea, and the kidneys of the fox, dried and beaten up in honey, applied externally for tonsilitis. A wolf's liver in mulled wine is a cure for a cough, also liver complaints. The liver of a fox in red wine, or bear's gall in water, facilitates respiration; for epilepsy, a bear's or wild boar's testes eaten, and also that of a sow; for fevers, deer's flesh;

and for dropsy, a wild boar's urine, dried in the bladder of the animal. The kidneys of the hare, dried and taken in wine, expel calculi, and those of the ass cure diseases of the bladder. With regard to the use of stag's flesh, Pliny states that "it is generally admitted to be long lived"; thus, he says, "the animal is not subject to fevers, and, indeed, it is a preservative against that complaint. We know of late, some women of princely rank who have been in the habit of eating the flesh every morning, and thus they arrive at an extreme old age free from all fevers."

Dioscorides, who lived in the first or second century A.D., states that the stomach of a wood pigeon, if drunk in wine, causes stones to be expelled from kidneys; he recommends boiled snails for dysentry, urine for viper bites and incipient dropsies, and its sediment as a local application for erysipelas; rennet of hare cures epilepsy and restrains haemoptysis; that of the horse is useful in dysentry and coeliac affections; stag's testicle is useful for vipers' bites and poisons, and ashes of burnt frogs in stopping hemorrhages. Earth worms are recommended for stopping tertians, and when boiled with goose grease cure ear affections when injected into them. Drunk in wine they are diuretic; a cock's brain in wine allays meningeal haemorrhages, and viper's flesh is advised for diseases of the bladder, and also cicadi in wine for same purpose; as aphrodisiac he recommends the testes of the cock and that of a well-fattened dog, the organ to be either eaten raw or crushed and prepared as a potion, or dried and drunk in wine; this is said to be the favourite draught of the dissolute Roman youth, and of the notorious Empress Messalina, wife of Augustus.

For nervous diseases he recommends hare's brains, and dried wolf's liver for hepatitis, desiccated fox's lung for dyspnœa. He has a whole chapter on the use of urine for curing dropsy, that of the patient himself being especially recommended as a drink; he dwells largely on the value of ordure, that of the boar, powdered and taken in vinegar or wine stopped haemorrhages and cured ruptures; as a useful stomachic he recommended fowl's gizzard dried and taken in wine.

Galen, A.D. 170, gives an account of the various uses in medicine of the dung of different animals—he also recommended blood of

goats, owing to its dryness, as useful if drunk with milk in dropsy and stones in the kidneys. Coagulated blood of kids with vinegar is advised for hæmoptysis, also the ashes of burnt frogs and vipers' flesh in quartan fever. For epilepsy he recommends the dried brain of a camel or weasel. He also said he knew many men in his lifetime cured of falling sickness by drinking the burnt powder of dead men's skulls.

Paulus Egineta, 7th century, recommends the belly of the cormorant, and the inner coat of a hen's stomach as stomachics. Urine he states cures epilepsy ; the parts about the lizard's kidney are aphrodisiac. He says, some consider the brain of a camel when eaten is useful for tremors, and the liver of an ass and goat relieves epilepsy. The hip bath of oil of a fox relieves arthritic pain, and pills made from the skull of a man who had been hung are useful for the bite of a mad dog.

In the Saxon Leechdoms, we find it is stated by Sextus Placitus that for hard-drawn breathing which is oppressive, a fox's lung sodden and put into sweet wine and administered, wonderfully healeth ; and for erysipelas an earth-worm rubbed thoroughly fine, with vinegar added, and the disease smeared therewith.

When the Roman Empire began to decay, 250-450 A.D., and the incursions of the barbarians of the North ravaged Spain, France, Italy, and North Africa, a period of intellectual stagnation set in, and the finer arts, including medicine, fell back into the chaos which prevailed over Western Europe for some centuries. But the wonderful influence of Greek literature was working on a distant Asiatic nation—the Arabians. Just as it had been said in old times that Greece took her Roman conquerors captive, so now for a second time, the Greek genius asserted itself, and again reigned supreme over the warlike race which had conquered it. Founded on Greek literature, Arabian medical science arose, and such was the eagerness and avidity with which it absorbed and translated the Greek medical science that the intellectual force and brilliancy of its teachers conferred a debt on Western medicine which it can hardly estimate. First and foremost amongst such is Mesue, well known and quoted as an authority down to the fourteenth century, under the name of Johannes Damascenus,

and whose real name is Abo-Zakirus-Yaluah-ben-Nasorriah, 777-857 A.D., and Physician-in-Ordinary to the Caliph Haroun the First, familiar to us all in the “*Arabian Nights*” as Haroun-al-Raschid. In his work “*Selecta Artis Medica*,” he recommends largely the use of animal extracts; thus he gives recipes for the preparation of a confection and linctus, both containing the testicles of the fox. The first he says excites and multiplies the sperm—“*appetitū ad coitum incitandum et multiplicandum semen. Spermaticum augendum.*”

In the chapter (13) *De Medicaminibus ad phthisicos*, p. 257, he says, “*Confectio testiculorum vulpis est phthisicis et consumptis medicina experta et dicta est antidotio.*” The *Liber Tractatus* contains a most careful prescription for preparing brains of birds—“*forma accipiendi cerebella avium quae administrantur in medicinis coitus.*” In the section *De medicinis aegritudinum pectoris et pulmones et primo et de asthmate, Liber Secundus*, he writes, “*Et pulmones animalium sunt mirabilis eis et proprie vulpis et ericii.*” For dyspnoea (*facilitantia anhelitum*), he recommends the lung of a fox dried, taken in a confection of hyssop, calaminth, Persian origanum, anise and pepper, and several of the aromatics—the dose was two drachms. “*Et ex rebus mirabilis ad hoc est, si pulmo vulpis siccus et proprie drach duæ cum eo quod convenit ex potibus. Et ex eis est hysoppus, et hasce, et calamentum, et origanum persicum, et anisum, et piper.*” *Oleum Vulpinum* is recommended for gout and other arthritic pains, and is most efficacious for nephralgia. For hepatalgia he prescribed an electuary containing wolf’s liver—“*Athanasia major obstructionem hepatis, et lienis liberat, dolorem sedat tum dictarum partium, tum ventriculi renum, hæmorrhoidum. Hepar autem lupi, quod tota sua substantia morbos hepatis juvat. Nam recipit hepatis lupi eupatorii, crocæ, moschæ, castorei spicæ, papaveris niger, cornu dextri capræ, vel alii legunt cerui—portiones æquales.*” He also gives a most careful prescription for preparing blood clot, and also for preparing and preserving bile in the gall bladder of animals and birds, which is used for eye diseases.

Albucasis, 1100 A.D., translated by Constantin the African, gives a long chapter on the uses of extracts taken from a variety

of animals—amongst which he evidently highly values those of the heart and testicle. The other great Arabian physicians, such as Rhases, Avicenna, Averroes, also all used similar therapeutic agents. Avicenna had a very high opinion of castor, especially in nervous affections, stupor and paralysis.

Guido de Chauliac, 1300, who was surgeon to the Papal court at Avignon, recommends in his work "*La Grande Chirurgerie*," the *cornu cervi* and *castoreum* —of the latter he writes, "*sont testicules de certain beste conforté les nerveux.*" He also prescribed mummy.

Albertus Magnus (1506) Bishop of Ratisbon, in his work, "*De Virtutibus Herbarium, de Virtutibus Lapidum, de Virtutibus Animalium*," gives a chapter on the uses of different animals; for aphrodisiac purposes he says: "When an incentive to love is required, that animal should be sought out which is hottest at the time of coupling, as it is the most powerful in provoking this quality. In the case of a man the best part adapted for such a purpose are the stones, and for the woman the womb. Hog's testes, dried and powdered, are to be given in wine to a man deficient in vigour, and hare's womb or stones to a woman." He also speaks of lion's heart as a cure for quartan ague.

Jerome Cardan (1566), in his work "*Ars Curanda Parva*" (Basle), p. 415, and in the section *Pro difficultate Spirandi*, gives his personal experience of taking wolf's lung: "*Aluid quoque q'd expertus sum in meipso, vis et inveni valde vinum dum anno milesimo quinqentisimo trigesimo primo laborante difficultate spirandi cum magna tussi. Es est ut capias pulmonem unum vulpis et ablualet cum vino statim, et siccatur in furno, inde fumatur 3s ex illo pulverto sublime è cum vitello ovi duabus vel tritus vicibus aluid est q'd edere pulmones animalium juvat non magno auxilio alq's prasenti ut expertus sum. Credo etiam quo quis uteretur longo tempore, quod ægrege juvaretur quia omne simile a similibus confirmatur.*" "Another remedy which I have personally tried twice, and which I found very useful when suffering, in 1531, from difficulty in breathing and violent cough, is the lung of a fox. The lung is washed in wine and dried in an oven, and powdered fine in the yolk of an egg and taken three or four times.

One may also eat the lungs of animals, and find good from it, as I have proved. I believe also that if someone were to use the remedy a long time, he would feel remarkably better, because every organ is benefitted by its corresponding one." He recommends mummy for rupture, and for syncope the testes of the cock, which organs are useful for convalescents as food. He believed in the efficacy of blood, and in the account of his life which describes his treatment of the Scottish Archbishop Hamilton, he gives his own personal experience of the efficacy of water distilled from the blood of a full-grown pig and colts-foot leaves. The dose of two ounces, taken with sugar twice a day, fattens a man rapidly.

Paracelsus, the Luther of Medicine, 1493-1541, recommended the sperma-semen of man against the imbecility of the instruments of generation ; the stercus in the form of ashes called carbon Humanus, cured agues, the extracts of man's skull, epilepsy. Platæarius, of the Falernian School, 1536, in his work "*De Medicinis simplis ab animalibus*," recommends brains of birds as aphrodisiac : "*Attende tamen particulariter circa cerebella avium qua solent administri in medicinus coitus, que debent accipi ex avibus qui midificant in domibus.*" He also recommends human skull for epilepsy, bone of stag's heart for hæmorrhage, preparation of human and goat's blood, dung of doves, and lung of wolf, inner coat of cock's stomach, flesh of lion, wolf's liver in sweet wine, and bile of hare and bile of vulture for hepatic complaints. He also has a whole paragraph on the use of mummies. The scinx's flesh promotes venery, "*Ad augmentandi sperma virtutem potissimum habet.*"

Adam Lonicerus, 1540 A.D., in his "*Naturalis Historia opus novum*," gives a large number of animal extracts for various diseases. Male elephant's blood is useful in epilepsy, that of the dog relieves tremors and cures alopecia, and its excrement is useful in jaundice. The ass's liver is good for epilepsy, and its fat incites to venery, its spleen relieves stomach affection and is good for phthisis. The fox's blood cures stone in the kidney or bladder, its fat convulsions. Brains of hare are useful in tremors due to debility ; wolf's heart in epilepsy ; stag's lung fumigated drives away coughs. Camel's urine is useful in atrophy, and its brain

cures epilepsy. He also recommends remedies from human urine, crocodile, squirrel, bear, beaver, cat, horse, boar and pig.

Andrea Matthioli, 1579, in his great pharmacopoeia gives a long account of the use and preparation of animal extracts, and also of the urine and blood. He was the first, according to Adams, to point out the mistake of the ancients in believing castor to be the testicles of the beaver.

Ambrose Paré, 1582, in his work "*Discours de la Mumie*," relates how a certain Guy de la Fontaine, who had travelled in Egypt, related to him a conversation he had with a Jew in Alexandria, who told him that the flesh of mummies, which he sold, served grandly for the cure of several diseases ; (*Que cette chair ainsi confite et embaumée servuoit grandement à la curation de plusieurs malades et principalement au cheuttes et coupes orbes, et memtrisseurs*), and that it seemed to Paré a fabulous thing, because rich and ancient families would not for all the money in the world allow that the bodies of their dead relations should be taken out of the country and eaten by Christians. The Jew further said that as the supply was not equal to the demand, owing to the custom of embalming bodies having long ago ceased, that he made his mummies out of the bodies of dead slaves, and after explaining the process, said he wondered how Christians, who were so dainty (*tant fian*) would eat the bodies of the dead (*encore lui dit s'efmerueilloit graddement comme les Chrétiens estoient tant fians de manger les corps des morts*).

Thomas Sydenham,* 1624-1689, has a formula in his pharmacopoeia called the *aqua epilepticus* or *ante-epilepticus*, in which the chief ingredients are shavings of a man's skull.

The Hon. Robert Boyle, 1626-1691, his great friend, and one might almost call him his clinical clerk, recommends in his work, "The Natural History of the Blood," a preparation called the spirit of blood obtained from the blood of healthy persons as a useful remedy in hysteria, pleurisy, coughs, apoplexy, and phthisis. He also prescribed hare's liver for hysteria and convulsions ; a draught of one's own urine taken in the early morning he con-

* Moses Charra, "Royal Pharmacopoeia," Translated into English. London, 1678, p. 225, Part iv., Book iii.

sidered a capital thing for obstructions, and also he recommended it as a topical agent for gouty and asthmatical persons, earth-worms for convulsions, millipedes for a sore throat, pig's dung for dysentery, and patella of dead man for ague.

Thomas Dover, M.D., 1660-1742, one of Sydenham's pupils and friends in his work "The Ancient Physician's Legacy to his Country," prescribes a toad dried and made into pills as a most excellent remedy for asthma, and for nephritis the inner coat of a pigeon's gizzards, finely powdered.

Liebauld, in 1628, in "*Les Secrets de Médicen*," a work published in Pau, and dedicated to Dr. Sainctpons, physician to the King and Queen of Navarre, recommended "*huille de os au mal cadue*," oil of bone of the lamb-doidal suture for epilepsy, and as a local application for gout, and for pains in the joints; the oil of human dung cured chancres and mortified fistulas; water distilled from man's dung, taken internally, is recommended for dropsy, chancres and obscurities of the eyes, and relieves epilepsy, also that of the swallow, whilst that of vipers cures fistula, and of the frog, epilepsy.

In "A Rich Storehouse or Treasury for the Diseases now set forth for the great benefit and comfort of poorer sort of people that are not able to go to the Physitians," 1596, are the following prescriptions: For a chin cough, take a mouse and flea it and tize it to powder in an oven and drink in ale. The same is good for them that cannot hold their water (cap. 210, fol. 43). To cure a canker in the breast, take goose dung and celandine, and lay them to the sore pappe (cap. 201). To stop bleeding at the mouth, nose and wounds, a dry toad in a linen bag is recommended. For the falling sickness, take the matrix of a sow and make into powder, and give the patient to eat (fol. 58).

Ulysses Androvandus published at Bonn, 1645, two large vols. entitled "*De Quadrupibus Bisulcis et De Quadrupibus Digitalis Viviparis et Oviparis*," in which, besides their Natural History, which is fully treated, is given an account of the uses of animals in medicine; he evidently was well acquainted with the writings of Pliny, Diocorides, Sextus, Chrosopus. He states that the testicles of a stag being drunk in wine "*concubitum excitat et fit cum voluptate veneris*." Burnt stag's horn is given for empyema and

hæmoptysis ; he gives a number of extracts from the goat, such as its testicle for epilepsy, liquid extract of the lung for phrenitis, and its liver for eye diseases. The buffalo's nails and horns were given for convulsions and its urine mixed with myrrh and oil for otalgia, and instilled into the ears.

In the second volume we find wolf's testes prescribed as aphrodisiacs. . . . “*veneris colori conducet et ad conceptionem pro mulieribus commendat.*” Its bile mixed with oil and instilled into the ears relieves otalgia, while its liver is useful in hepatic affections and its lung in phthisis ; lion's liver in wine relieves hepatalgia and its brain mixed with oil and instilled into the ears otalgia. Brain of dogs is a useful application for glaucoma and fractured bones. Porcupine flesh on account of its dryness is useful if taken internally for dropsy. Hare's lung is useful in epilepsy and its bile clears the vision.

Fernel, 1656, in his work, “*Universa Medicina,*” recommends the *cornu cervi et ebur, ustium et lotium* for uterine diseases, also the *stercus vaccinum* as an external application in arthritic pain, chap. xxvii. p. 421. His *Electuarium Diarrhodon* contains *ossis è corde cervi* and another has *sanguinis hiscini preparate*, and there is a *trochiscus è viperæ*.

Daniel Beekherius, 1660, published a work called “*Microcosmus Medici,*” in two vols, the first being called “*Liber Primus, De Medicina è viventis hominis corpore desumenda et præparanda. Liber Secundus, De Medecina è cadavere humano desumenda et præparanda et usurpanda.*” In the first volume are a large number of preparations from hair, nails, saliva, sweat, placenta, urine, the last being recommended for a great number of diseases, and a large number of different preparations are given, also *Stercor sperma*, of which he expresses his strong disapproval (*usus in medicina abominabilis est*) stone from the bladder, on which he discourses and develops the doctrine of affinities, thus he says “*Tanta enim est Creatoris nostri clementia quod eo in ipsa morbi mortisque causa, causa simul sanitatis et vitae delitescentem demonstrat—sic sane similibus similia curantur.*” The preparations from the dead human body include a large number made from the brain *mixtura cephalica elegans habebis thesaurum divinissimum* also *liquor cephalicus—aqua insignium Virium.*

He says that if a human brain cannot be obtained, that of hares is a good substitute. He gives a number of prescriptions for preparations from the human skull (*pulveres, electuæ, tabula, spiritus, oleum, sal cranii humani*) also a chapter on preparations from mummy.

*Burton, 1676, says in his “*Anatomy of Melancholy*,” “How many things are related of a man’s skull, what several virtues of cornes in a horse’s legge, of a wolf’s liver, or divers excrements of beasts, all good against several diseases.”

Jacobus Huchnerwolf, 1680, in his work “*Anatomia Pœonæ, in quo natales*,” prescribes a *vinum contra epilepsiam*, containing *rasura cranii humani*, also a *spiritus* of the same for epilepsy and hysteria.

The first *Pharmacopœia* published in 1618 by the College of Physicians, contains several preparations of animal extracts. The Species *Cordiales Temperatiæ, Diamagaritus Frigidus, Pulvis ad Lumbricus* contain bone of stag’s heart; there are also preparations containing human and goat’s blood, wolf’s lung, horn of unicorn, marrow of stag, spawn of frogs, ordure of doves, musk, mummy, scorpion; in connection with bone of stag’s heart we have indirectly an interesting reference to its use by †Harvey. In a letter written by the Countess of Nottingham to Daniel, the second Earl, dating her letter December 28th, 1719, she directs him to copy “from her father’s receipt book, where among some directions of Dr. Harvey’s I think there’s one how the bone of a stag’s heart is to be taken,” and goes on to say it may be unnecessary to take so serious a remedy, but none the less it will be well for her lord to have it by him (Finch, the first Earl of Nottingham, had married Harvey’s niece Elizabeth, daughter of his brother Daniel). In the 1639 edition of the *Pharmacopœia* we find added preparations of worms and millipedes, and balsam of mummy; with regard to this last one‡ Sir Thomas Browne remarks “Egyptian Mummies, which Cambyses and time hath spared, avarice now consumeth. Mummy is become merchandise. Mizraim

* “*Anatomy of Melancholy*,” part 2, section 4, sub-section 3, p. 229. *Medicinal Physick*, London. Eighth edition. 1676.

† Norman Moore. *Harveian Oration*, 1901. p. 29, 30.

‡ “*Hydrotaphia*,” p. 158.

cures wounds, and Pharaoh is sold for balsam." There were also other preparations of mummy, such as tincture, elixir, and *aqua divina*. In the year 1677 a vast number of preparations of animal extracts appear, such as the skull of a man who had suffered a violent death. (*Cranium hominis violentâ morte extincti*). Stone from the human bladder; brain of hare and swallow, saliva of fasting persons, testicles of horse and cock, urine of youth and an adult, also of wild boar, spleen of ox, intestines of fox and wolf, moss grown on a dead man's skull.

Dr. William Salmon, in his work, "The New London Dispensatory," published 1677, which is a kind of extra Pharmacopoeia, gives an enormous number of preparations of extracts from the human body and from all kinds of animals. Thus there is a preparation of the *cor hominis* in powder for epilepsy, also of the ox, the stag, the pig, the horn of the stag, the rhinoceros, the unicorn, the liver of the wolf, the otter, and the frog, and the marrow of the goat, the ox, the stag, and the calf. There are several preparations from a man's skull—thus the *tinctura*, the *aqua*, *oleum*, *sal*, and the *essentia cranii humani*, also a *spiritus cerebri humani*—and a number of preparations from the mummy, as well as definite directions for making artificial mummies. He considers the body of a healthy young man as the best for the purpose. We have an interesting reference to the use of the *spiritus cranii humani* in the case of King Charles II. The symptoms of his case and the medical treatment adopted by the fourteen physicians have been well narrated by Sir Henry Halford* and Lord Macaulay.† The latter, after describing the King's urbanity, with which he apologises for the unconscionable slowness of his death, says: "The patient was largely bled, a hot iron applied to his head, a loathsome salt, extracted from human skulls, was forced into his mouth." Macaulay adds: "The fourteen doctors who deliberated on the king's case contradicted each other and themselves. Some of them thought the fit was epileptic, and that he should have his doze out. The majority pronounced him to be apoplectic, and tortured him during some hours like an Indian at the stake. . . . Nothing better than dissension and

* "Deaths of Eminent Persons." † "History of England," vol. i., chap. 10.

vaccillation could be expected from such a multitude of advisers. But many of the vulgar not unnaturally concluded, from the perplexity of the great masters of the healing art, that the malady had some extraordinary origin—*i.e.*, murder.” Sir Henry Halford states that the salt was given in a julep of twenty-five drops “*ad refocillandas regis vires.*” He also states that he saw a prescription for the same preparation which was found in the house of Cromwell’s apothecary, Duke Street, Westminster, and which was used in the case of Sir Nicholas Throckmorton.

Dr. R. Pitt, in his work called “On Frauds and Villainies of the Common Practice of Physic,”* p. 172, has a scathing criticism on the use of some of these animal extracts. Thus he says: “When you pass to the medicines taken from animals, I will mention only the most ridiculous and of no manner of virtues. . . . Are not the bone of the heart of an old stag or the glands of the corner of the eye turned to bone in extreme old age admirable cordials for a feeble old man? Shall the falling sickness have no better medicine than a dry skull of one executed twenty years before, or the other end of a beast, the hoof of an elk or an ass? There are many of the wise Physicians who will prescribe the jaw-bone of a pyke, the stone in the head of a carp and a perch, the tooth of a Bore to the lung inflamed in pleurisy. When the stomach wants a good digestive they will apport the skin of the stomach of an hen, and for the bowels, the dried gut of a wolf or fox, whose crackling and stinking lungs are reserved for the most dangerous asthmas.”

It is stated, in the “Handwriting of Junius,” of the Princess of Wales in the reign of George III., that nothing keeps her alive but the horrible suction of toads. In a work called “An Enquiry into the Nature, Rise and Progress of the Fevers most common in London,” by William Grant, M.D., 1771,† we find the following passage:—“A country gentleman assured me that a well-formed ague is frequently cured by the following bolus taken after the

* R. Pitt, M.D., F.R.C.P., F.R.S., Physician to St. Bartholomew’s Hospital. “The Frauds and Villanies of the Common Practice of Physic.” 1705.

† “An Enquiry into the Nature, Rise and Progress of the Fevers most common in London.” William Grant, M.D., 1771. Pp. 86, 87.

fit, and repeated every eight hours until the next fit is expected. He assured me that he had not at that time seen it fail and that three such doses generally performed the cure. He never saw more than six required. Take a large spider, bruise it, and mix it with currant jelly to make a bolus." This remedy is not so absurd as it seems, for Bence Jones discovered an albuminous substance furnished by the spider and contained it in its web, which is the exact analogue of cinchona. It will be noted that spider and its web were prescribed by Dioscorides, Matthiolus, and Androvandus for ague. Further, with regard to the use of toad, it has been proved that its glands contain a substance called phrynin, which has a powerful influence on the heart, and when injected under the skin of a dog or guinea pig proves fatal effects as a nerve poison. Further, it has been found that its skin secretes a fetid substance like digitalis, and hence the old practice of prescribing preparation of toad for dropsy has a rational basis, and is not a ridiculous idea.

In his "Practice of Physic," vol. i. B. p. 786, Sir Thomas Watson refers to the use of the web of the black spider in ague, and says, "This substance has been tried on a tolerably large scale and the testimony to its curing agues is very strong, and that in case of sixty prisoners from the vanquished squadron of Theurot in the Isle of Man, in 1760. Dr. Gillespie found it answered admirably, and in cases which had obstinately resisted bark. This experience was later confirmed by Dr. Jackson, in the West Indies in 1801, in cases where bark, arsenic and mercury had failed. Not only did it arrest the fits of ague, but removed such symptoms as pain, delirium, vomiting and griping." Cuthbert Bede speaks of a spider covered with dough and taken as a pill as being used as a remedy for ague in the Fen country. A lady in the south of Ireland was famous for the universal remedy she gave for ague, being a large spider in treacle or preserve.*

In the edition of the *Pharmacopœia* published in 1721, there are officinal preparations from apes, scorpions, ants' eggs, the human *nephriticus lapis*, and excrements of birds. With regard

* *Notes and Queries*, vol. ii., p. 259.

to the use of ants' eggs, there is a quotation from Butler's* "Hubibras":—

"Till purging comfits and ants' eggs,
Had almost brought him off his legs."

The 1746 edition contains fewer preparations of animal extracts, and we only find claws and eyes of crabs, horn and bone of stags' heart, the *Lapis Bezoar*, millipede, viper, and lizard; whilst the 1788 edition contain only *Decoc. cornu cervi*, and that of 1809 *cornu ustium* and *spongia ustia*. The only preparation from animals contained in the edition down to the latter part of the last century were *pepsin*, *pancreatin*, *fel bovis*, *cantharides*, *moschus*, *castoreum*.

It is stated that when William Pitt, January, 1803, was dying at Putney, a bottle of oil of hartshorn was brought to him by a Mr. South, which Sir Walter Farquhar allowed him to take, without any beneficial result.

Even down to the present day, some of the ancient ideas prevail in modern Europe. In Denmark,† in some few places, human excrements are used as epispastic applications for inflammation of the breasts. In the Rhine provinces, urine is taken for fever, instead of quinine. In Lincolnshire, Kirkwall, and the Western Islands, the grated portion of a human skull was given to epileptics. In the Blue Book on the Burgher Refugee Camps, lately published,‡ is given an account of a girl with dropsy, who was wrapped up from her hips down to her feet in a poultice made from horses' dung. Goats' dung and wormwood, made into a decoction and drunk, in quantities, is used for bringing out the rash of measles, and rags wetted with human urine are used for open flesh wounds, and a decoction of horses' dung is considered efficacious in the treatment of typhoid fever.

PART II.

TESTICULAR EXTRACT.

The scientific use, and consequent revival, of animal extracts as therapeutic agents in modern medicine may be traced to the lectures given in 1869 at the Paris School of Medicine by Dr.

* Butler's "Hubibras." Part 1, Canto 3, Lines 325-6. 1684.

† Dr. O. Moetler, "Denmark Hygiene and Demography," p. 57.

‡ Dr. Baas, "Hist. Med." p. 57.

Brown-Séquard, his principal object being to establish the fact that all glands, with or without excretory ducts, give to the blood by an internal secretion principles which are of great importance, if not necessary, and his experiments, made at Nahant, Boston, U.S.A., in 1875, confirmed this view, and he further thought that if the internal secretion of a gland taken from a living animal could be safely introduced into the blood of men suffering from lack of that secretion, important therapeutic results would follow. In 1889 he read a paper before the Biological Society of Paris, in which he stated that he had found the means, and that it consisted of subcutaneously injecting the liquid extract obtained from glands under pressure. He first injected himself with the fresh extract of the testes of young dogs, with the result that he experienced a return of vital energy and rejuvenescence, with renewed and efficient peristalsis and control over the bladder and sphincter. From these results he started the theory that the testes secreted into the blood certain products which powerfully influenced the bodily metabolism, more especially that of the nervous tissue, Pasteur, Bogroff, Variot, and many others confirmed his view, while others have entirely failed to obtain any result at all ; in some cases it may be due to the fact that the glandular extract was not given fresh, as directed by Brown-Séquard, as sometimes it was boiled or dried or given by the mouth. Brown-Séquard and D'Arsonval have stated that, unlike the thyroid, thymus, or medulla of bones, the sexual glands and the pancreas are inert if swallowed ; they recommend either a subcutaneous injection or a rectal one, which is nearly as efficacious. They published in 1893* a remarkable series of 342 cases of locomotor ataxy which were either greatly ameliorated or cured. Depoux, Gilbert Victoroff of Moscow, and Ouspensky report 85 per cent. of successes in various scleroses of the spinal cord, and 90 per cent. in locomotor ataxy. In 103 cases of cancer 97 were ameliorated, as shown by the healing of ulcers and cessation of pain and haemorrhage, but the tumours themselves were unaffected. In phthisis Cornil, Hénocque, Lemoine and Variot, and others, obtained favourable results, also Constantin Paul. Although Brown-Séquard's results

* "Comptes Rendus de l'Académie des Sciences," vol. cxvi., April, 1893.

have not been confirmed by subsequent experience, yet his general statement as to the restorative power of testicular juice when subcutaneously injected is practically admitted. It produces a steady increase of oxyhæmoglobin, cardiac force is strengthened, vascular tone is exalted, and oxygenation of waste products is promoted (as indicated by the increase in urea), and diminution of phosphoric acid in the urine. The mind becomes more clear and active. In anæmia the hæmoglobin has increased from 3 to 14 per cent., and in tuberculosis it has caused the cough to lessen with general bodily improvement and fall of temperature. In insanity its effects have been indefinite, except in some cases to improve the physical condition. Although the internal secretion of the gland has not been actually obtained the results of castration in children point to its existence, for it is well known that in such cases the hair does not grow, the skin remains soft, the arm and leg lengthen and the muscular state is poorly developed, the voice remains a treble, the mammae undergo enlargement, and such persons in later life tend to grow fat. Grey Edwards* has published six cases in which much benefit was received by taking tabloids of orchitic extract. A. E. Wright†, of Netley, recommends the testicle minced up and locally applied for arresting surface hæmorrhage, on account of the nucleo-albumin which it supplies.

OVARIAN EXTRACT.

It is stated by Brown-Séquard that ovarian extract has a similar but less powerful effect than testicular extract, and he quotes sixty-three cases of old women benefited by its use. That the ovary contains some secretion of powerful physiological influence over metabolism is seen in cases of young girls whose ovaries have been both removed—a practice apparently common in barbarous parts of Asia. In such cases the characteristic changes at puberty do not occur, the pelvis does not enlarge, menstruation is absent, and the mammary glands and genital organs atrophy ; further, certain abnormal changes peculiar to the male occur, as pointed out by Hunter, such as the growth of hair in the form of a beard or moustache, and the voice is more masculine than usual.

* *Brit. Med. Jour.*, vol. i., 1895, p. 1261.

† *The Lancet*, Jan. 18th, 1896, p. 153.

Similar changes occur in a modified degree after double ovariotomy in adults, in whom this operation tends also to cause melancholia, palpitation, giddiness, and obesity. These symptoms are often relieved by the therapeutic administration of the ovarian extract which also often benefits such conditions occurring in the normal menopause. Cattle-breeders are well aware that removal of the ovaries in the cow increases the richness of the milk and also its quantity. That this condition occurs when all connexion with the spinal cord or sympathetic is severed, points strongly to some internal secretion from the ovary into the blood, influencing the mammary gland which favours metabolism. In favour of this it has been proved that double ovariotomy causes diminution of metabolism with increase of bodily fat, and a lessened excretion of phosphoric acid. Bescon and Camboulois (" *Le Suc Ovarien, Effets Thérapeutiques* ") have found great benefit in the use of ovarian extract after castration and in amenorrhœa with chlorosis and in the menopause.* Professor Landau used extract of pig's ovaries with beneficial results in climacteric troubles and in the symptoms following oophorectomy and amenorrhœa from prolonged lactation and hysteria.† Bodon, in a case of epilepsy, developing at the menstrual period, with scanty flow, found ovarian extract of great benefit, causing cessation of the fits and increased flow.‡ Ferré and Bestron state that ovarian juice can cause death in over-doses, and that males are more susceptible than are females. Given to dogs in over-doses the ovarian extract causes erection and ejaculation of semen ; in large doses it causes haemorrhage into the spinal cord and death ; it is also given as an aphrodisiac. Stanley Boyd, assuming from Beatson's work the influence of the ovarian secretion over the mammary glands, has performed oophorectomy in fifty-four cases of cancer of the breast —nineteen, or 35 per cent., were more or less benefited, and thirty-four were not benefited, or only doubtfully. In Group I. of successful cases life was prolonged on the average for six months, and in 6 per cent. immunity was obtained for two and a-half years. It is true that in some of the cases the thyroid extract

* Congrès Français de Médecine, Montpellier, 1898.

† *The Lancet*, July 4th, 1896, p. 62.

‡ Orvosi Hetilap (*The Lancet*, May 1st, 1897, p. 1245).

was given, but it is difficult, as Stanley Boyd states, to estimate its value, for it was only administered when he had satisfied himself that oophorectomy had failed ; he seems to think that the drug has no real effect. Lastly, he points out that Beatson introduced this operation for *inoperable* cases of cancer. Butlin* considers the operation of oophorectomy as useless, and Roger Williams considers it as horrible.†

THE THYROID EXTRACT.

The study of the theories which have from time to time been put forward with regard to the action of this gland in the economy truly illustrates the drastic criticism of Dr. James Ward on scientific theories. In his work on "Naturalism and Agnosticism"‡ he tells us : "The story of progress is briefly this—divergence between theory and fact one part of the way, the wreckage of abandoned fictions the rest." But the experimental work of Schiff, von Esselberg, Kocker, Victor Horsley, Murray, and others, has thrown a flood of light on the subject, and has established that myxoedema and its infantile form cretinism are diseases caused by the loss of the colloid secretion of the gland, due to atrophy of its substance. The clinical results obtained, first by grafting a portion of the gland, as suggested by Horsley, in myxoedema, and, secondly, by injecting subcutaneously a glycerine extract of the gland, according to Murray's method, are truly astonishing. A large number of cases have now been published of the remarkable results obtained.

Since 1889 I have had seventeen cases of myxoedema under my notice. Four of the patients were men, and thirteen were women. I have been able to keep in touch with all the male cases, and with nine of the female patients. My earliest case is that of a man who had suffered from myxoedema for ten years. He came under my care in 1889, and I have shown him before the Society on two or three occasions. He has now been under the thyroid treatment, first by injections and then by the dried powder extract, for eleven years, and when I saw him last week

* *Brit. Med. Jour.*, Jan. 4th, 1902, p.10.

† *Ibid.*, Jan. 11th, 1902, p. 111.

‡ "Naturalism and Agnosticism," vol. i., p. 153.

he was in excellent health. In another case the patient has been under treatment for ten years, and he is well. Mr. F. E. Cockell a few days ago kindly gave me an account of a case which I saw with him in 1896. He states that the man is in very fair health, and that he takes a thyroid tablet occasionally. In the fourth male case, also, the patient, after two years' treatment, is well. Of the female cases one patient has been under treatment for eleven years, another for ten years, and the others range over periods of seven years, six years, two years, and one year, and are all keeping free from the disease. Of the remaining four patients, one has died, and three I have lost sight of.

In cretinism Murray, Byrom Bramwell, and Thomson have published some extraordinary results of thyroid treatment—in one case the patient grew four and three-eighth inches in one year, and in another six and a-half inches in six months—with marked diminution of the blurring of the features, enlargement of the tongue, and the pendulous abdomen. In a woman, aged twenty-seven years, the growth was four and a-half inches in three and a-half years, and a remarkable development of the mammary glands took place with return of regular and normal menstruation, and improvement in the mental condition—the last feature, as Murray points out, is much more marked in patients under twenty years of age, and is in proportion to the duration of the disease.

It is remarkable that cretinism, like myxoedema, is more prevalent in the female sex than in the male sex, though not by any means in the same proportion, it being practically two to one against seven to one in the latter. Further, there is an undoubted connection between goître and cretinism, as it has been well attested that in districts where both are endemic one generation may be affected with goître and the succeeding one with cretinism. Besides myxoedema and cretinism, Murray* has well shown that the simple parenchymatous goîtres which occur in adolescents and young adults derive great benefit from thyroid administration, and further, that it is often

* "The Treatment of Simple Goître in Young Adults," *Edinburgh Medical Journal*, August, 1900.

quite sufficient to obviate the necessity for surgical interference. It would seem that in these cases, as he suggests, the gland is called upon for extra secretion, that true hypertrophy is set up, and that the artificial supply enables the gland to rest and to undergo a partial atrophy, and so diminish in size. Under this treatment the enlarged gland may lessen to two-thirds, one-half, or even one-third of its former size. In cases where there are adenomata or cysts this treatment causes diminution of the gland tissue itself, in which they are embedded, and thus enables an operation to be carried out more easily. Kennicut* collected sixty cases of non-malignant and non-cystic cases of goître, fourteen of which were cured, twenty-nine improved, and seventeen not improved. Angerer† states that in seventy-nine cases which he treated by thyroid extract, the goître was diminished in all of them. Stabel reports improvements in 92 per cent. of the cases, and that when treatment was discontinued the goître began to increase.

Besides the thyroid tissue itself there are four bodies in close anatomical relationship with it, termed the "parathyroids," and it has been shown experimentally that when portions of the thyroid body are removed, a compensatory hypertrophy takes place, but that the structure thus produced is normal parathyroid tissue rather than normal thyroid. Again, the structure of the thyroid body in exophthalmic goître resembles more closely that of parathyroid tissue than normal thyroid; and, lastly, experiment demonstrates another remarkable fact, as yet unexplained, that removal of all the parathyroid bodies, small as they are, is followed by the same fatal effect that follows complete removal of all thyroidal tissue, and although the parathyroids do not contain colloid material, yet Hutchison has found iodine in their composition. The removal of the parathyroids, according to Gleg, causes tremour, slow and unstable gait, and emaciation—a very different condition to the effects caused by removal of the thyroid itself, which, as Murray has shown, produces in the monkey subcutaneous swelling, dryness of skin, loss of hair, and a sub-

* "Transactions of the Congress of American Physicians and Surgeons," 1897, vol. iv., p. 148.

† "Münchener Medicinische Wochenschrift," 1896, p. 593.

normal temperature. It is certainly remarkable that though the parathyroids contain iodine they have no effect when given in myxoedema, and that in exophthalmic goître, the symptoms of which partially resemble the loss of the parathyroid, they are in no way beneficial. From the symptoms of thyroidism, and the clinical contrast of the two diseases, it has been supposed that exophthalmic goître is due to over-action of the thyroid gland and the administration of the thyroid extract, which was recommended at first, has not been considered advisable ; indeed, in many cases it produces positive harm.

Tempting as the theory is that exophthalmic goître can be explained on the "over-action" theory, yet, as Hutchison points out, the absence of uniformity in the histological changes of the gland, the fact that the symptoms may be unilateral, and that the gland itself may not in some cases be enlarged in Graves's disease, and can hardly be considered as over-acting, and the absence of any toxicity or alteration in the colloid secretion of the enlarged gland tends to destroy this hypothesis.

The thyroid extract has been used by Beadles,* Carter,† Claye Shaw,‡ and Woods,§ and found useful in cases of myxoedema with insanity, and the latter condition has in some cases been entirely cured. Macpherson|| and Dunlop, Bruce and Macphail extended the treatment to insanities generally—and these results met with so much success that many others have used the thyroid but with very varying results, the recoveries being from 0 to 50 per cent. Out of 1,032 cases collected by Mabon and Babcock,¶ 16.8 per cent. of the patients recovered, 24 per cent. improved, and 59.2 remained unimproved. Easterbrook treated 130 cases, and had 12 per cent. recoveries, in cases which were intractable to other forms of treatment. Large doses were used in every case, except in the myxoedematous form, and Easterbrook seems to think that it is the briskness and intensity of the metabolic reaction

* "The Treatment of Myxoedema and Cretinism," *Journal of Mental Science*, July and October, 1893.

† *Brit. Med. Jour.*, April 16th, 1892.

‡ *Ibid.*, August 27th, 1892.

§ "Transactions of the Hunterian Society," April 12th, 1894, p. 50.

|| *Edinburgh Medical Journal*, May, 1892 and 1893.

¶ *American Journal of Insanity*, October, 1899.

produced which is the valuable effect in large doses in insanity, and that the drug clears out of the system various transitional, and perhaps toxic, products of metabolism. All the patients who recovered improved physically as well as mentally. He concludes by saying that the thyroid is a powerful metabolic stimulant, and that the early quickening of the pulse, the phosphaturia, and nervous and mental symptoms, all point to a special affinity of the drug for the nerve centres ; further, that while small doses were tolerated well by the patients in all of his cases, large doses were badly borne by those under twenty years of age, and much more so by those over the age of sixty years, the former specially tending to lose weight, and the latter to exhibit failure of the pulse ; also by patients who were emaciated, and those also who were obese, probably in the latter case due to fatty degeneration of the heart. In cases of valvular heart disease the drug was borne well, but these patients were also treated by rest and cardiac tonics. Four of his patients had carcinoma of the lower lip, oesophagus, pylorus, and pancreas respectively. No amelioration was produced except in the pyloric case, in which the gastric symptoms disappeared, the patient increased in weight, and had a continuance of good health for two years, when fatal haemorrhage occurred ; the diagnosis was confirmed post-mortem. The parathyroid extract has no effect in insanity, except to raise pulse tension (Easterbrook : The Medico-Psychological Association Prize Essay, p. 38).

The therapeutic use of the thyroid extract has been extended in many directions, to which I will refer, although time does not permit me to do so as fully as I could wish. Byrom Bramwell,* struck by the marked changes in the condition of the hair and skin after thyroid treatment in myxoedema, determined to try its effect in certain skin affections, and obtained some remarkable results in psoriasis, lupus, ichthyosis, and alopecia. In a paper read by myself before this Society† on October 25th, 1894, I narrated cases of psoriasis, ichthyosis, and chronic eczema which I had treated with much benefit in this way. Abraham has

* *The Lancet*, Jan. 27th, 1894, p. 210.

† "Transactions of the Hunterian Society," 1894, p. 76.

published the results in ninety cases of different skin affections, and has shown that there is a minority benefited by thyroid extract. Pringle* has shown from a careful and systematic study that the thyroid produced the more easy formation of healthy cicatrix in cases of cutaneous tubercle properly and systematically treated, and thus tends to prevent badly-developed and unhealthy scar tissue. The type of case which answers best is that with superficial ulceration and hyperkeratosis. Sir Hugh Beevor† showed before this Society in 1898 two remarkable cases of universal alopecia successfully treated by thyroid extract. In tetany the extract has been used with marked benefit and success, which is interesting, as tetanic symptoms have been observed after thyroideectomy. It is also very useful in relieving spasmodic torticollis, also in fibroid of the uterus, and uterine haemorrhage of some kinds it is said to be useful. Wooldridge showed some years ago that thyroid juice destroys anthrax poison. In certain forms of obesity the thyroid extract has produced remarkable results, and it has been found of use in promoting union of fractured bones (Gautier), and in progressive myopathy, according to Lépine, it is beneficial.

In 1896,‡ Beatson, of Glasgow, introduced the operation of oophorectomy, combined with the administration of thyroid extract for cases of inoperable carcinoma of the breast, and obtained some striking results, and last year he reported another successful case.§ Herman has reported eight cases which he has treated in this manner, and which he has subsequently watched. In one the patient was alive and well four years after the operation ; in the second and third life was prolonged by about eighteen months of good health, in the fourth by one year, in the fifth and sixth no benefit occurred, in the seventh there was some benefit, and in the eighth there was decided benefit. Other surgeons, such as Watson, Cheyne, Eve, and Lockwood, have obtained similar results, but Langton has stated that only from

* "International Clinics," fifth series, April, 1895, p. 343. *British Journal of Dermatology* vol. viii., 1896, p. 43.

† "Transactions of the Hunterian Society," April 13th, 1898.

‡ *Brit. Med. Journal*, June 6th, 1896, vol. i., p. 1386.

§ *Brit. Med. Journal*, Oct. 20th, 1900, vol. ii., p. 1167.

18 to 19 per cent. are benefited by this treatment, and Butlin, who gave thyroid alone in his cases, obtained no benefit from it in any.

A remarkable case is recorded by Mr. F. Page and Dr. W. H. Bishop* of a woman, aged sixty-one years, who was twice operated upon for carcinoma of the breast and its subsequent recurrence. As another recurrence took place a further operation was declined, and the thyroid treatment alone was tried for a period of ten months, at the end of which time the disease had entirely disappeared, but six months afterwards there was another recurrence, and the patient died.

THE SUPRARENAL EXTRACT.

In 1836, Brown-Séquard, struck by Addison's work, investigated the action of the suprarenal glands and published the results of his experiments in animals, which are as follows. 1. That removal of the two capsules in dogs, cats, and rabbits, and other animals causes death rapidly, and more so even than extirpation of the kidneys. 2. That if a long interval is left between the removal of one and that of the other capsules life may last long, but as shown by Tizzoni the animals die after considerable weakness or paralysis from a special organic disease of the nervous centres. 3. That the blood of animals deprived of the suprarenals is a poison acting powerfully on other animals, as shown by Langlois and Abelous. 4. That animals dying from the absence in blood of the secretion of these glands after removal can be revived at least for a time by the injection of the liquid suprarenal extract. These statements of Brown-Séquard were entirely confirmed by Abelous and Langlois, and although the experimental work of other observers, amongst whom Tizzoni's must be confessed as important, as pointing in a negative direction, yet all modern work tends to confirm strongly the conclusion that the suprarenals are functional glands of importance to the animal economy. In 1894, Chaufford† published an account of a female patient, aged thirty-five years, suffering from Addison's disease, whom he treated by subcutaneous injection of suprarenal extract,

* *The Laneet*, May 28th, 1898, p. 1460.

† *La Semaine Médicale*, 1894, p. 74.

prepared according to D'Arsonval's formula—13.5 cubic centimetres being given in the course of nine days; the result was doubtful. Similarly, Bra* recorded two cases—a man, aged thirty-seven years, and a woman, aged forty-two years—whom he had treated with negative results. Oliver† has published an account of a patient who took forty-five grains daily of the extract; there was improvement in every respect, the bronzing became less, the appetite improved, and nausea seldom occurred. The case was under observation for two years, and improvement was maintained so long as the treatment was kept up. He records, also, two other cases which derived benefit from the treatment, and also another under the same treatment for eleven weeks without marked benefit. Box has recorded in the St. Thomas's Hospital Reports‡ the treatment of six cases of Addison's disease by the suprarenal capsule administered either by the mouth or by the rectum, but as four of the patients were in an advanced stage of the disease, one cannot draw any conclusion; in two other cases, however, although large doses were given, amounting in all to 7,200 grains in one case, and 3,255 in the other, no real improvement took place in either. Although, as I have stated, Schäfer and Oliver found that the active principle of the suprarenal extract is not destroyed by artificial digestion, Vincent could produce no physiological effects on dogs and rabbits by large doses, and Grünbaum failed to raise his own blood-pressure by taking the suprarenal extract by the mouth. Box states that in five out of seven cases the suprarenals were found to be caseous, and he records an interesting fact that in one case, where there was no naked-eye evidence of tubercle, a guinea-pig was successfully inoculated with tuberculosis from it. Delépine had previously recorded a negative result. Rolleston, in his Goulstonian Lectures of 1894, records the case of a woman who had improved under suprarenal treatment. Lloyd Jones§ also published a case of Addison's disease which derived marked benefit in large doses from the treatment, the patient becoming practically well. Simi-

* "La Méthode Brown-Séquard."

† *Brit. Med. Jour.*, 1895, vol. ii., pp. 561 and 653.

‡ "St. Thomas's Hospital Reports," 1898.

§ *Brit. Med. Jour.*, 1898, vol. ii., p. 483.

lar cases are recorded by Sansom* and Stockton.† Kennicut has recorded forty-eight cases of Addison's disease, of which six were reported to be cured, twenty-two improved, eighteen unimproved, and two aggravated by the treatment. Ringer and Phear‡ record a case of a woman, aged twenty-eight years, who temporarily improved for four weeks under forty-five grains daily, increased up to a quarter of an ounce daily, but who subsequently died. It is interesting to note that Schäfer and Oliver obtained no results from suprarenals, the medulla of which was caseous, and the cortex of which was sclerosed, showing that there was no active principle. Dyer found the active principle in the suprarenal vein, and considered it a true internal secretion. J. S. Bury§ treated a case of Addison's disease in a girl, aged thirteen years, with suprarenal extract without benefit. Douglas Stanley|| considered that the suprarenal extract in a case of splenic anaemia produced a marked increase in red blood corpuscles. The benefit was temporary; post-mortem examination revealed sclerosis of the spleen, the pancreas, and the suprarenals.

The use of suprarenal extract, like that of the thyroid extract, has been extended in other directions besides the one for which it was originally given. Langley¶ states that the extract has a specific stimulating action on nerve-endings, and that it produces effects similar to the stimulation of some one or other sympathetic nerve. Oliver and Schäfer** have shown that it is one of the most powerful vaso-constrictor and cardiac tonics we possess, and that it acts alike on striped and unstriped muscular tissue, given either locally or by the mouth, and they consider that it might be of the greatest clinical value in cases of sudden cardiac failure due to shock, or haemorrhage, or an overdose of anaesthetics, or for promoting uterine contraction, and recommend its very slow injection into a vein or, in extreme cases of cardiac failure, into the heart-wall itself. Gottlieb has shown that in animals poisoned with

* "Transactions of the Medical Society of London," 1895.

† *The Lancet*, Nov. 16th, 1895, p. 1226.

‡ "Transactions of the Clinical Society of London," 1896.

§ *The Lancet*, June 19th, 1897, p. 1678.

|| *The Lancet*, Feb. 16th, 1895, p. 413.

¶ *Journal of Physiology*, vol. xviii., p. 277.

** *Brit. Med. Jour.*, Oct. 6th, 1900.

chloroform or chloral until the pulse has almost ceased, the circulation is almost at once restored by injecting the suprarenal extract into a vein. Further, another remarkable property of the extract is the smallness of the active dose. Thus one-tenth of a dried gland produces a maximal effect on the heart and arteries of a twenty-pound dog, and it is concluded from this that one-eighth-hundredth part of a grain is capable of producing a well-marked physiological effect in an adult man, which is the smallest active dose on record of any drug in the *Pharmacopœia*, and when compared with the dose of digitalitis and ergot required to produce a similar result, when subcutaneously injected, is markedly in contrast. Bates* has shown that the intravenous injection differs in effect from that of the hypodermic or from that when the extract is given by the mouth. This action of the glands explains very well the extreme muscular debility and weakness, and the low arterial tension in Addison's disease, where its influence is absent. Acting on the results he obtained, Oliver suggested, and also tested, the value of the extract where there is loss of vaso-motor tension, as in asthenia, anaemia, cyclic albuminuria, and diabetes mellitus, in which last condition, according to Pavy, a vaso-motor paralysis involving chylo-poietic viscera, may stand at the foundation of the form of diabetes limited to defective assimilation of carbohydrates, also in exophthalmic goitre, heart disease, and capillary haemorrhages. In one case of cyclic albuminuria, Oliver states that the albumin disappeared and that in another it diminished. My experience in these cases, so far, is doubtful. In two out of three cases of diabetes mellitus, under Bradford, Ringer and Poore, at University College Hospital, the glucose was diminished. In a case of exophthalmic goitre the pulse-rate was lessened, and the thyroid gland and exophthalmia were reduced. If exophthalmic goitre is due to over-secretion and absorption of the colloid material, suprarenal extract ought to be of benefit, as it has exactly the opposite effect on the vaso-motor system to the thyroid.

Valentine, Cleghorn, Cunningham, Kennicut, and Borulta have confirmed Oliver and Schäfer's results in the use of the

* *New York Medical Journal*, Oct. 16th, 1900.

suprarenal extract in heart disease. I have not been able to come to any definite conclusion as yet with regard to its value in these cases. Kenworthy has given the extract in fifteen cases of hæmoptysis with good results. This I have tested in several cases, with apparent good effects in some, but, as you are fully aware, there is no more *quæstio vexata* in medicine than to determine the *post hoc* and *propter hoc* action of drugs in checking hæmoptysis which often tends of itself to cease spontaneously. Cohen states that suprarenal extract is very useful in asthma associated with vaso-motor ataxia in neurotic subjects. T. D. Lister has informed me of a case of asthma with low pulse tension which derived great benefit from the extract. Douglas has found it of great service in hay fever when applied locally or given internally, and Curtis has used sprays of it (half a drachm to one ounce). Floersheim* has shown that the suprarenal extract often restores strength and regularity to a feeble and irregular heart, and confirms Schäfer and Oliver's statement that it does not cause rapidity of action, because it stimulates the inhibitory centre, but that if the vagus is divided, the heart's action becomes more rapid and forcible. Bates† sums his conclusions as to its actions on the heart as follows :
1. The internal administration does not affect the normal heart and normal blood-pressure. 2. An intermittent pulse becomes regular and a weak pulse stronger. 3. It is temporary in action. 4. It is the most powerful cardiac stimulant known. He also states that cases of exophthalmic goître are markedly benefited by it, and that all inflamed tissues, such as occur in congestion of the eye, the throat, and the larynx, are most decidedly relieved by its application, either locally or if swallowed, and that by its powerful astringent action it facilitates operations on these parts in congestion of the larynx and tuberculous laryngitis with marked benefit. In intra-tympanic surgery Phillips has shown that the extract is of great service from its powerful vaso-constricting action. It is remarkable that the extract appears to have no toxic effect whatever, however frequently used internally or externally. As a local application it relieves pain occurring in

* *New York Medical Journal*, Oct. 6th, 1900.

† *Medical News*, March 24th, 1900, and *Medical Record*, March 17th, 1900.

cancer of the breast, oesophagus, and tuberculous laryngitis, and periodontitis as recorded by E. A. Peters,* and also its topical use successfully arrested severe epistaxis in a case of haemophilia.† In insanity, Easterbrook‡ considers the extract of use in cases of acute maniacal excitement where, as Maurice Craig has pointed out, there is low blood-pressure, and also because it lessens tissue oxidation.

THYMUS GLAND EXTRACT.

The experiments of Turelli on dogs show that extirpation of the thymus causes loss of strength and appetite, with diminution of red cells and haemoglobin and increase of white cells. Abelous and Billard§ state that the thymus in the frog is an indispensable organ ; total ablation of it causes weakness, paresis, and paralysis, haemorrhage, and oedema with death from auto-intoxication. Svehla|| using a watery extract of thymus from a man and animals says that intravenous injection in man, in the pig, and in the cat caused (1) lowering of blood-pressure, (2) acceleration of the pulse from its action on the heart, and (3) in large doses restlessness with dyspnoea and death. Reinbach, who applied the thymus clinically in Mackinley's clinic, says that it causes diminution in the size of goitre in cases of exophthalmic goitre, but in about 50 per cent. of the cases the goitre was unaffected. Hector Mackenzie¶ tested the action of the thymus in doses varying from several ounces to ten or fifteen grains a day on twenty cases of exophthalmic goitre. His conclusion is that it has no effect on the heart or goitre or exophthalmos, but that it appears to be a remedy of some value, as it improves the general condition, and some of the patients were satisfied that it benefited them. On the other hand, fifteen cases which he also collected are published by different observers—Tatz and Guérin, Arthur Maude, Parker, ** Metcalfe, †† Owen and

* *The Lancet*, March 2nd, 1901, p. 619.

† *Brit. Med. Jour.*, 1901, p. 1009.

‡ The Medico-Psychological Association, Prize Essay, 1900, p. 48.

§ "Comptes Rendus de la Société de Biologie, Archives de Physiologie," October, 1896.

|| "Chl. f. Phys.," 1897-8, p. 477.

¶ *American Journal of the Medical Sciences*, vol. cxiii., p. 132.

** *Brit. Med. Jour.*, 1897, vol. i., p. 528.

†† *American Journal of the Medical Sciences*, vol. cxiii., p. 132.

Cunningham*—in fourteen of which marked improvement took place in the pulse-rate, exophthalmos, and goître. Dreschfeldt tried the thymus in three cases without benefit. Mobius in his work on Basedow's disease, says that several patients improved but not more or sooner than under other modes of treatment. I have seen distinct improvement in two cases, and also in two cases of tachycardia. Macalister has reported temporary improvement in pseudo-hypertrophic paralysis.

THE PITUITARY EXTRACT.

Complete removal of the pituitary body causes lowered temperature, loss of appetite, twitchings, tremour, and death. Howell† has shown that intravenous injection of the infundibular part of the pituitary gland causes a rise of blood-pressure, but that the hypophysial portion does not. This rise is accompanied by slowing of the pulse, which still persists, though to a less extent, after division of the vagi. Schäfer and Swale Vincent§ confirmed these statements, and also found a second substance which produces a well-marked fall of blood-pressure like cholin, but its action is not neutralised by atropine. Injection subcutaneously of a decoction of the infundibular part of the hypophysis shows a certain correspondence with the action of the suprarenal extract in causing contraction of the arterioles and augmentation of heart-beat. The conclusion of these observers is that at present our observations appear to indicate that there may be specific active substances in the infundibular part of the pituitary gland, which usually do not occur in nervous matter.

The pituitary extract has been used in cases of acromegaly owing to its hypertrophy being considered as a primary cause of disease. Ransom|| has obtained negative results in two cases with its use. H. D. Rolleston¶ has published a case treated by the combined use of thyroid and pituitary extract on the theory that the gland is sometimes enlarged in myxoedema and is vicarious

* *The Lancet*, August 22nd, 1896, p. 569.

† *The Practitioner*, August, 1896, vol. lvii., p. 154.

‡ *Journal of Experimental Medicine*, vol. iii., 1898.

§ *Journal of the Physiological Society*, March 18th, 1897.

|| *Brit. Med. Jour.*, 1895, p. 1259.

¶ *The Lancet*, April 25th, 1896, p. 1137.

in action, and though Schäfer and Oliver have shown that the intravenous injection of the infundibular part of the pituitary extract and thyroid are exactly opposite in effect, yet they have found a second body in it which, like the thyroid extract, produces a fall of blood-pressure. In Rolleston's case headache was relieved, but it is well known that this symptom may be relieved alone by the thyroid. A case of acromegaly was shown some time ago by our late President, Mr. F. Gordon Brown, who informs me that the thyroid extract continues to relieve the headache. Probably there is some connection between acromegaly and exophthalmic goître, as the former is sometimes associated with some symptoms of the latter, such as pigmentation, and Schäfer and Oliver have shown the similarity in action of the infundibular portion and suprarenal extract on the heart and arterial system. Kennicut has collected thirteen cases of acromegaly treated by pituitary extract; seven showed varying degrees of improvement, five none, and one became worse. In two the violent headache and neuralgic pain in the limbs were lessened. R. Caton* reported a case of acromegaly which whilst under pituitary extract varied in condition, but showed marked and rapid improvement when the thyroid extract was given alternating with it. Parson† also reported a case where the headache was relieved and general improvement took place under thyroid extract. R. W. Dodgson‡ also reports a case of acromegaly in which the lethargy became less and memory improved under the pituitary extract. Von Cyon§ has shown lately that the pituitary body regulates intracranial blood-pressure and bodily metabolism.

HEPATIC EXTRACT.

At the Thirteenth International Congress held at Paris in 1988, Gilbert and Carnot || gave an account of their experimental researches on extract of liver. Injections of the extract in rabbits and dogs, whether subcutaneous or rectal, caused acceleration of

* *The Lancet*, Feb. 9th, 1895, p. 349.

† American Neurological Association.

‡ *The Lancet*, March 21st, 1896, p. 772.

§ "Pfluger's Archiv für Physiologie," Band lxxviii., 1901, p. 565.

|| "L'Opothérapie Hépatique dans le Diabète Sucrée, Section Thérapeutique, XIII. Congrès International de Médecine.,,

biliary secretion and increase in urea, and they found that in cases of alimentary glycosuria in man, after absorption of the liver, that the total quantity of glucose eliminated is smaller, the results being more marked when the absorption takes place by the rectum than by the stomach. The liver extract appears, therefore to stimulate the hepatic cells and to help it to store up more carbohydrates and to transform them better. If there is hepatic over-activity any specific stimulant would tend to still further exaggerate it. In diabetes mellitus due to functional debility of the liver Gilbert and Carnot found the liver extract to be beneficial, and they record a case of a woman with diabetic gangrene of the foot, in whose case the sugar was reduced from 160 grammes to 38 grammes in four weeks. The patient relapsed several times when the treatment was stopped, but each time derived benefit when it was again resumed, and the gangrene was healed. In cases of diabetes due to over-activity of the liver, the extract does harm by increasing the sugar eliminated ; it may be thus used as a means of diagnosis of an under-acting or over-acting liver, as well as a therapeutic agent. In alcoholic cirrhosis with ascites, jaundice, and oedema and haemorrhages, the extract has proved very beneficial, also in a case of atrophic cirrhosis. According to these authors, pancreatic extract increases the sugar in diabetic cases which hepatic extract controls. I have used hepatic extract in one case of diabetic phthisis, and under its influence the sugar apparently diminished. No other medicine was used.

THE PANCREATIC EXTRACT.

Besides the action of the gland in aiding digestive processes, it has been found by the experiments of Minkowski, von Mering, and others, that it plays an important part in certain forms of diabetes mellitus. By experimentally removing *in toto* the gland in dogs they produced diabetes mellitus ; further, Médon showed that if only a small portion of the pancreas be left, even if it has no intestinal connection, diabetes is not produced, and that even a graft of the gland subcutaneously is sufficient to prevent diabetes. These experiments led Lépine to put forward the internal secretion theory that has been further elaborated by Tuckett, who con-

siders that the pancreatic secretion neutralises a toxic substance absorbed from the intestine through the lymph stream.

Although experimental removal of the pancreas produces diabetes mellitus, it is a remarkable and interesting fact that injections of pancreatic extract, whether subcutaneous, intravenous, or peritoneal, and also pancreatic feeding, have not the slightest effect in preventing the glycosuria, and clinically the same has been found to be the case. Dixon and Lépine have published interesting statistics on this treatment.

Hector Mackenzie* has published results of two cases treated by the liquor pancreaticus with the result of general improvement, increased strength, and lessened thirst and quantity of urine, but no diminution in the sugar. Neville Wood† obtained a similar result, possibly due to pancreatic pills, but in another case a negative result. Combe‡ has reported a case of diabetes of eight years' duration cured by taking pancreatic sandwiches. He considers that the internal secretion is a glycolytic ferment which renders inert circulating glycoses. Williamson§ has published an interesting table of twenty-six cases of diabetes mellitus in all of which the pancreas was examined. In eight well-marked changes were found, in four slight changes, and in five atrophy. He suggests, like Tuckett, that in these cases the glycosuria is due to the absorption of a toxic substance from the intestine which is neutralised by the internal secretion of the pancreas. Lauder Brunton, in 1874, tried raw meat for diabetes. Williamson also quotes Gilbert and Carnot,|| who, in cases of diabetic extract of definite hepatic origin, advise the administration of hepatic extract, which they consider acts by either increasing the power of the liver to store up reserves of sugar, or to cause a more rapid destruction of hydrocarbons taken as food. In 1868, Langdon-Down¶ published a case of fatty diarrhoea with diabetes, which he treated with the pancreatic extract with a very successful result. The fat entirely disappeared from the stools, the sugar

* *Brit. Med. Jour.*, Jan. 14th, 1893, p. 63.

† *Ibid.*, p. 64.

‡ *Brit. Med. Jour.*, Epitome, 1895 (99).

§ *Practitioner*, July, 1900, p. 68.

|| *La Semaine Médicale*, May, 10th, 1897.

¶ "Transactions of the Clinical Society of London," vol. xi., 1868, p. 119.

also disappeared from the urine, and the man gained in weight. Von Noorden has used pancreas and preparations of it with good result in cases of chronic steatorrhœa accompanying diabetes, and in other cases of chronic steatorrhœa depending upon disturbance of the function of the pancreas.

EXTRACT OF INTESTINE.

E. Vidal, of Perigueux, has shown from experiments on rabbits that if pig's faecal matter be injected into the marginal vein of the ear, the animal developed in fifteen seconds violent convulsions and died, whereas in another animal of the same weight which had been previously injected with extract of intestine, and then subsequently injected with faecal matter, the only symptoms were slight dyspnœa with fairly marked myosis without convulsions, and the animal did not die till the following evening, from which it would appear that the intestinal extract neutralised the toxic effect of the intestinal poison, the subsequent death of the animal being due to the inevitable septicæmia set up by a fluid rich in bacteria. Occlusion of intestine in rabbits, guinea-pigs, and rats, showed that where the intestinal extract had been injected immediately the animals lived longer than the check ones, and that even where stercoræmia had been allowed to commence, injection of the extract preserved the animal's life longer, but in this case a much larger dose was requisite, so that not only has the extract a preventive, but also a curative action. Vidal applied this knowledge clinically, and has recorded a desperate case of strangulated hernia in a man, aged forty-nine years, with superficial respiration, intermittent pulse, and incessant faecal vomiting, in whom, after injection of the glycerinated intestinal extract, the general condition of the patient greatly improved, and the removal of an enormous mass of gangrenous tissue, the two ends of the intestine being fixed to the skin, was successfully performed, and after three subsequent injections of the extract, the patient recovered without interruption. Vidal concluded that the operation would not have been successful unless the toxic poison had been neutralised. There is no doubt whatever that patients in cases of strangulated hernia, even when the operation has been

fully successful, sometimes die from stercoræmic poisoning, and to avoid this surgeons now advise emptying of the bowel above the stricture by a puncture with a small trocar and injecting into the bowel a dose of magnesium sulphate through the cannula after emptying it. Vidal has also recorded a case of invagination in a boy, aged six years, in whose case injection of the glycerine extract neutralised stercoræmic poisoning. The importance of this work has been confirmed in quite another direction by alienists.

Since Bouchard's classical work on the toxicity of the urine, when he showed that in normal urine there existed seven toxic substances not present in cases of uræmia, owing to retention in the body, great attention has been paid to auto-intoxication from products of the gastro-intestinal canal, which are believed to cause certain forms of nerve disease and of insanity. W. Ford Robertson* states: "I am strongly inclined to the belief, which is supported by a large amount of evidence, that various forms of toxæmia of gastro-intestinal origin are the chief factors in the pathogenesis of a large array of acute and chronic diseases, including severe mental diseases, such as general paralysis, senile insanity, locomotor ataxy, idiopathic epilepsy, acute and chronic mania, and melancholia," and he has demonstrated in proof of his views marked alteration in the structural condition of the stomach and intestine in general paralysis, leading to auto-intoxication from disordered products of gastro-intestinal formation. Lately John Macpherson,† Commissioner of Lunacy in Scotland, has stated in his last report that he regards the symptoms of vaso-motor disturbance and sudden loss of nervous function, which are characteristic of the early stages of general paralysis, as indicating the probable action of a toxic agent in the alimentary canal, and that it is, in fact, a form of auto-intoxication. Some years ago, Sir Andrew Clark started the theory that anæmia and chlorosis in young girls was due to an auto-intoxication from the constipation so commonly associated with this condition. In a minor degree the symptoms of constipation are well known to us all, and one

* *Brit. Med. Jour.*, October 26th, 1901.

† *Edinburgh Medical Journal*, December, 1901.

is reminded of the saying of Lord Byron in one of his letters, where he writes : "Talk of champagne, there is nothing that cheers your spirits like a dose of Epsom salts."

RENAL EXTRACT.

Brown-Séquard, believing that uræmic symptoms are only partly due to accumulation of certain substances in the blood, recommended renal juice in cases of kidney disease, and showed from experiments on rabbits and guinea-pigs that life lasted much longer after the extirpation of both kidneys when injections of renal liquid were used, and he points out that there is a marked difference in the mode of death in cases of anuria when the internal secretion continues, even though the kidneys are in a great part diseased, to that of cases of disorganisation of the kidney when the internal secretion is stopped ; the difference being one of much less violence than in Bright's disease and nephritis. In support of his view he quotes the case recorded by Sir James Paget* in which for thirteen days there was total suppression of urine without any symptoms of any kind. He also states that in these cases the condition is not to be explained by vicarious urination of the skin. D'Arsonval injected renal liquid in a case of uræmia with temporary benefit, but the patient ultimately died. Neale† quoted an analysis and comparison of urine and beef-tea made by Masterman,‡ who showed how closely similar they are in composition, the only difference being that beef-tea contains less urea and uric acid, and therefore both are stimulants and not nutritious agents. Neale states that one of the worst cases of epistaxis which he had seen and which had resisted every form of European medicine, ceased after the patient drinking a pint of urine, and he had also seen in South America a glass of a child's or young girl's urine tossed off with gusto and apparent benefit as a tonic. He states that in that country urine is a common vehicle for medicine, and that of little boys is highly recommended for malignant small-pox. Moss§ used the glycerinated renal liquid

* "Transactions of the Clinical Society of London," 1869, vol. xi., p. 171.

† *Practitioner*, 1881, p. 343.

‡ *The Lancet*, June 22nd, 1878, p. 924.

§ *La Clinica Moderna*, Dec. 1st, 1897.

in rabbits, healthy and nephrectomised, and obtained only negative results. In 1852, Bauer found urate of ammonia and guano of great value, if used externally, in phthisis, lupus and morphœa. In 1862, Hastings published an elaborate report on the treatment of phthisis by the excreta of reptiles. Lately H. Harper* has given urea in certain cases of phthisis, which appear to have derived much benefit from its use—the ground on which it is given being that phthisis and gout are antagonistic.

SPLENIC EXTRACT.

Schäfer and Oliver have shown that the intravenous injection of splenic extract in a dog causes an immediate fall of arterial pressure, followed by a pronounced continued rise. Wood† states that he used extract of spleen with some benefit in exophthalmic goitre, but he points out that it is badly borne by the stomach, as it causes pain and vomiting, and that hypodermic injections are apt to produce local abscess. He was led to its use in exophthalmic goitre by the fact of the spleen being enlarged in myxoœdema and cretinism, and after thyroidectomy, thus suggesting a relationship between the two glands. Carpenter‡ recommends the extract in typhoid fever on the principle that absence of leucocytosis is a marked feature in this disease, and he considers that it ameliorates the symptoms, reduces the temperature, and hastens recovery.

In their clinical studies with spleen and thyroid extracts Charles Bois and Neilkerr§ state that they treated twenty-two cases with eight recoveries, and they sum up as the result of their investigations (1) that the most general result of this treatment is physical improvement; (2) that its action on the mental state is undoubtedly evident in a fair proportion of cases, especially of adolescents, and sometimes direct, and at other times owing to improved physical conditions; and (3) that it materially assists in rendering thyroid treatment efficacious, the patient after a course of spleen treatment becoming more susceptible to the action of the thyroid.

* *The Lancet*, March 9th (p. 694), June 15th (p. 1672), and Dec. 7th (p. 1567), 1901.

† *American Journal of the Medical Sciences*, 1897, p. 511.

‡ *Medical Record*, Feb. 17th, 1900.

§ *Brit. Med. Jour.*, vol. ii., 1898, p. 684.

PULMONARY EXTRACT.

At the French Medical Congress, held at Montpellier, in 1898, Brunel* gave an account of the use of pulmonary juice (" *Quelques Indication Nouvelles sur l'Emploi du Suc Pulmonaire* "), and considered it an efficacious adjuvant in certain conditions where it is possible to stimulate the vital resistance of the patient, but he expressly states that it is not bactericidal or antitoxic in its action (" *mais comme un remède renforçant la résistance de l'organisme du poumon en particulier* "). It acts best in cases of pleuro-pulmonary suppuration with osteo-arthritic condition, as described by Marie—in this the amelioration is rapid and the bony deformation is arrested—but it is useless in advanced cases of phthisis. Arnozan† has employed pulmonary juice with success in purulent pleurisy of a chronic nature communicating with the exterior either through the pleura or into the bronchial tubes, and non-tuberculous in character, and associated with bony changes. He states that the temperature falls, the pus becomes less abundant and more clear, and the articular stiffness and weakness disappear. Cassaet‡ (" *De l'Action du Suc Pulmonaire* ") states that tuberculous cases with a chronic pleuro-pulmonary septic condition are much benefited by pulmonary juice.

NERVOUS EXTRACTS.

The researches of Halliburton have shown that extract of sympathetic ganglia produces a fall of blood-pressure, and that other extracts of the nervous system, as the brain, spinal cord, and ganglia and nerves, produce the same result. The effect can be explained on the hypothesis that cholin is the principal active agent. Gumprecht, like Mott and Halliburton, found in normal cerebral spinal fluid minute doses of cholin and in diseased conditions, in which the katabolic side of nervous action is preponderant, cholin is immensely increased. Thus Mott§ and Halliburton state that in 150 cases of general paralysis examined by them they found widespread degeneration, not due to degenerative

* " *Congrès Français de Médecine, Montpellier, 1898,* " vol. ii., p. 370.

† *Ibid.*, p. 363.

‡ *Ibid.*, vol. iv., p. 366.

§ " *Transactions of the Medical Society of London,* " Feb. 27th, 1900.

condition of the nerves, but to the production of such powerful poisons as cholin or neurin found in the cerebro-spinal fluid of general paralytics, the poison being the result of auto-intoxication. Brain extract has been recommended by Brown-Séquard and Althaus in epilepsy, locomotor ataxia, chorea, and neurasthenia. In mental diseases no definite results have been produced. Robertson thinks that brain extract may act as a tonic in mild and early cases of neurasthenia.

MAMMARY GLAND EXTRACT.

Shober* states that extracts of sheep's mammary gland in tablets equivalent to twenty grains of the desiccated gland, given by the mouth, three times a day, have a positive action on the uterus, causing contraction, and so diminishing bleeding. It is, therefore, similar to ergot, but far more reliable and surer, and its continued use has no unpleasant effects in uterine fibroids, characterised by excessive and weakening menorrhagia and metrorrhagia ; bleeding can be controlled in a few weeks, and the health of the patient is improved. The tumours are inhibited in growth, and diminish in size up to a certain point, and by its use the patient can be placed in a more favourable condition for operation. It is also useful in subinvolution of the uterus from any cause unassociated with cancer or structural change, the uterine canal coming down from three inches to one and a-half inches in five or six weeks. Leucorrhœa and irregular bleeding cease, and backache and other reflexes disappear. It is of no use in cancer, dysmenorrhœa of ovarian and tubal origin, or malposition or stenosis.

PAROTID GLAND EXTRACT.

The extract of this gland is of much use in controlling the pain of uncomplicated ovaritis, where the ovaries are enlarged and prolapsed.† Bell, of Glasgow, has found parotid extract useful in ovarian disorders, especially in cases of enlarged and tender ovaries with dysmenorrhœa, metrorrhagia, chronic endometritis, and subinvolution.

* *Journal of the American Medical Association*, July 28th, 1900, p. 215.

† *Ibid.*

I have endeavoured to bring before you a method of therapeutics which starting from remote antiquity has come down to the present day, and whilst “ tracking out how new thoughts are linked to old ones, and seeing how an error cast into the stream of time leaves a streak behind, lasting through many changes of the way of man, and noting the struggle through which a truth now rising to the surface, now seemingly lost in the depths, eventually swims triumphant on the flood, we may perhaps the better learn to appraise our present knowledge, and the more rightly judge what of the thoughts of to-day is on the direct line of progress.”* That John Hunter should have independently observed the effects of removal of the essential organs of generation is not surprising—it was simply the outcome of his all-grasping and all-observing “ don’t-think-but-try ” intellect. But to him is also due the credit of making these observations in a scientific spirit, and although the words “ internal secretion ” are not once mentioned in his original paper, yet one cannot but feel they are writ large across it. The records of our Society show that this spirit of observation has never been wanting in our Fellows. It is only necessary to recall such names as William Blizzard, Clift—who, though not belonging to our Society, attended its meetings—the Babingtons, Richard Bright, John Hilton, and Jonathan Hutchinson to prove our intellectual affiliation with John Hunter. Let us in our turn see that we pass on the sacred fire to those who will come after us, ever mindful of the words of the greatest Hunterian orator “ that in the world of thought ‘ he that is mortal may produce that which is immortal.’ ”†

* Sir Michael Foster : “ The History of Physiology,” 1901, p. 1.

† Sir James Paget : Hunterian Oration, 1877, p. 36.

